

Claims

1. A chimeric kidney located on or near a large blood vessel in the abdomen of a mammalian host, in which the 5 chimeric kidney is capable of producing urine.

2. The chimeric kidney according to claim 1, in which the chimeric kidney is located in the peritoneal cavity of the host.

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3. The chimeric kidney according to either of claim 1 or claim 2, in which the chimeric kidney is in fluid communication with the host's large blood vessel via the hilum of the chimeric kidney.

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4. The chimeric kidney according to any preceding claim, in which the chimeric kidney is in fluid communication with the host's large blood vessel via vasculature which originates at the large blood vessel and which enters the 20 chimeric kidney within an area defined by a frustoconical shape having a cone angle of less than 90 degrees and an apex at the chimeric kidney.

5. The chimeric kidney according to any preceding claim, 25 in which the chimeric kidney has developed a ureter to facilitate externalisation of urine.

6. The chimeric kidney according to any preceding claim, in which urine produced by the chimeric kidney is excreted 30 via the host's ureter.

7. The chimeric kidney according to any preceding claim, in which the chimeric kidney is formed from an embryonic metanephros.

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8. The chimeric kidney according to claim 7, in which the embryonic metanephros is porcine.

9. The chimeric kidney according to any preceding claim, in which the host is human.

5 10. The chimeric kidney according to any preceding claim, in which the large blood vessel is the renal vein.

11. The chimeric kidney according to any of claims 1 to 9, in which the large blood vessel is the renal artery.

10 12. A chimeric kidney multiplex comprising two or more chimeric kidneys as defined in any of claims 1 to 11.

15 13. The chimeric kidney multiplex according to claim 12, in which the chimeric kidney comprises an interconnecting manifold linking the two or more chimeric kidneys.

20 14. A method of increasing the nephron mass of a mammalian recipient comprising implanting a metanephros of an embryonic mammalian donor on or near a large blood vessel of the recipient under conditions that allow the metanephros to become vascularised.

25 15. The method according to claim 14, in which the large blood vessel is located in the peritoneal cavity.

16. The method according to either of claim 14 or claim 15, in which the vascularised metanephros forms a chimeric kidney that produces urine and develops a ureter that facilitates externalisation of the urine.

30 17. The method according to any of claim 14 to claim 16, in which the large blood vessel is the aorta or a branch of the aorta.

18. The method according to claim 17, in which the large blood vessel is a renal artery, an iliac artery, a gonadal artery or an hepatic artery.

5 19. The method according to either of claim 15 or claim 16, in which the large blood vessel is the vena cava or a branch of the vena cava.

10 20. The method according to claim 19, in which the large blood vessel is a renal vein, an iliac vein, a gonadal vein or an hepatic vein.

15 21. The method according to either of claim 15 or claim 16, comprising the steps of making a surface abrasion on or near a superior lobe of a liver of the recipient and implanting the metanephros on or near the abrasion to allow the metanephros to connect to an hepatic blood supply.

20 22. The method according to any of claims 14 to 21, in which the metanephros has an intact renal capsule.

25 23. The method according to any of claims 14 to 22, in which at least two whole metanephroi, each with renal capsules intact, are implanted into the recipient.

24. The method according to any of claims 14 to 23, in which the metanephros is allogeneic to the recipient.

30 25. The method according to any of claim 14 to 23, in which the metanephros is xenogeneic to the recipient.

26. The method according to claim 25, in which the metanephros is derived from a non-human (for example porcine) embryonic mammalian donor.

35 27. The method according to claim 26, in which the porcine donor is free of zoonoses.

28. The method according to any of claims 14 to 27, further comprising immunosuppressing the recipient.

5 29. The method according to any of claims 14 to 28, in which the metanephros is obtained from the donor within 2 to 4 days after embryonic development of the metanephros begins.

10 30. The method according to any of claims 14 to 29, in which the metanephros is obtained from the donor prior to the presence of significant blood vessels within the metanephros.

15 31. The method according to any of claims 14 to 30, in which the recipient has reduced functional renal mass prior to implantation of the metanephros.

20 32. The method according to any of claims 15 to 31, in which after the ureter of the chimeric kidney develops, a ureter to ureter anastomosis is performed to provide fluid communication between the ureter of the chimeric kidney and a ureter of the recipient.

25 33. The method according to any of claims 15 to 31, in which after the ureter of the chimeric kidney develops, a ureter to bladder anastomosis is performed to provide fluid communication between the ureter of the chimeric kidney and the bladder of the recipient.

30 34. The method according to claim 33, wherein the metanephros is implanted on or near the iliac vein or iliac artery.

35 35. The method according to any of claims 15 to 31, the recipient's ureter is connected (for example, anastomosed)

to a cyst (for example, containing urine) located around the ureter developed by the chimeric kidney.

36. The method according to any of claims 14 to 35, in  
5 which two or more metanephroi are implanted into the recipient.

37. The method according to claim 36, in which the two or  
10 more embryonic metanephroi are linked using an interconnecting manifold.

38. The method according to any of claims 14 to 37, in which the mammalian recipient is a juvenile or adult.

15 39. The method according to any of claims 14 to 38, in which the metanephros is implanted within five hours, preferably 2 to 4 hours, after removal from the embryonic donor.

20 40. The method according to any of claims 14 to 39, in which prior to implantation of the metanephros, renal tissue is removed from the mammalian recipient.

25 41. The method according to any of claims 14 to 40, in which the metanephros is transplanted to a site within a recipient and connected to the large blood vessel via a tube or canula.

30 42. A chimeric kidney obtainable using the method of any of claims 14 to 41.

35 43. A method of growing a donor embryonic mammalian metanephros in a mammalian recipient, comprising the step of implanting the metanephros on or near a large blood vessel of the recipient under conditions that allow the metanephros to become vascularised.

44. A method of reducing the inflammatory response following implantation of a donor embryonic mammalian metanephros in a mammalian recipient, comprising the step of implanting the metanephros on or near a large blood vessel of the recipient under conditions that allow the metanephros to become vascularised.